

## 2017 ASE Correlation Chart

### Engine Repair (A1)

**MLR-** Maintenance & Light Repair

**AST-** Auto Service Technology (Includes MLR)

**MAST-** Master Auto Service Technology (Includes MLR and AST)

	Task	Priority	MLR	AST	MAST	Text Page #	Task Page #
<b>A. General: Engine Diagnosis; Removal and Reinstallation (R &amp; R)</b>							
1.	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	P-1		✓	✓	130-132; 135-137	6;29; 66
2.	Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1	✓	✓	✓	128-132	25-28; 30; 43; 44; 46; 59; 93; 100; 104
3.	Verify operation of the instrument panel engine warning indicators.	P-1	✓	✓	✓	198-199	50; 57
4.	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1	✓	✓	✓	257-258	40, 67
5.	Install engine covers using gaskets, seals, and sealers as required.	P-1	✓	✓	✓	440-441	115
6.	Verify engine mechanical timing.	P-2	✓	✓	✓	436-437	99

	<b>Task</b>	<b>Priority</b>	<b>MLR</b>	<b>AST</b>	<b>MAST</b>	<b>Text Page #</b>	<b>Task Page #</b>
7.	Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.	P-1	✓	✓	✓	67-69	82
8.	Inspect, remove and replace engine mounts.	P-2		✓	✓	276	31
9.	Identify service precautions related to service of internal combustion engine of a hybrid vehicle.	P-2	✓	✓	✓	277	42; 285
10.	Remove and reinstall engine on a newer vehicle equipped with OBD; reconnect all attaching components and restore the vehicle to running condition.	P-3		✓	✓	284- 285; 450	78; 117
<b>B. Cylinder Head and Valve Train Diagnosis and Repair</b>							
1.	Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures.	P-1		✓	✓	308- 310	79; 84
2.	Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-1		✓	✓	298- 301	83;85; 88
(2)	Identify components of the cylinder head and valve train	P-1	✓ (MLR only)			303- 308; 340- 351	87
3.	Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2		✓	✓	298- 300; 346- 352	94
4.	Adjust valves (mechanical or hydraulic lifters).	P-3	✓	✓	✓	278- 281	77; 96

	<b>Task</b>	<b>Priority</b>	<b>MLR</b>	<b>AST</b>	<b>MAST</b>	<b>Text Page #</b>	<b>Task Page #</b>
<b>5.</b>	Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing.	P-1		✓	✓	342-355	76
<b>6.</b>	Establish camshaft position sensor indexing.	P-1		✓	✓	837-838; 851	99
<b>7.</b>	Inspect valve springs for squareness and free height comparison; determine needed action.	P-3			✓	322-333	89
<b>8.</b>	Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action.	P-3			✓	333-335	90
<b>9.</b>	Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action.	P-3			✓	312-316	86
<b>10.</b>	Inspect valves and valve seats; determine needed action.	P-3			✓	320-332	91
<b>11.</b>	Check valve spring assembled height and valve stem height; determine needed action.	P-3			✓	332	92
<b>12.</b>	Inspect valve lifters; determine needed action.	P-2			✓	349-352	95
<b>13.</b>	Inspect and/or measure camshaft for runout, journal wear and lobe wear.	P-3			✓	355	97; 113

14.	Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action.	P-3			✓	342; 429	98
<b>C. Engine Block Assembly Diagnosis and Repair</b>							
1.	Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-1		✓	✓	288; 400	114
2.	Disassemble engine block; clean and prepare components for inspection and reassembly.	P-1			✓	286- 290; 294- 299	80
3.	Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action.	P-2			✓	296- 299	83; 105
4.	Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action.	P-2			✓	386- 389	81; 106
5.	Deglaze and clean cylinder walls.	P-2			✓	388- 390	107
6.	Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action.	P-3			✓	425	98; 108
7.	Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action.	P-1			✓	384- 385; 402- 404	111

8.	Inspect main and connecting rod bearings for damage and wear; determine needed action	P-2			✓	408-409	112
9.	Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action.	P-3			✓	425-426	101
10.	Inspect and measure piston skirts and ring lands; determine needed action.	P-2			✓	376-377	102
11.	Determine piston-to-bore clearance.	P-2			✓	388-391; 429-431	109
12.	Inspect, measure, and install piston rings.	P-2			✓	431	103
13.	Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time.	P-2			✓	401-404	113
14.	Assemble engine block.	P-1			✓	420-432	116
<b>D. Lubrication and Cooling Systems Diagnosis and Repair</b>							
1.	Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, gallery plugs: determine needed action.	P-1	✓	✓	✓	200-202; 206-209	36; 49; 51
2.	Identify causes of engine overheating.	P-1		✓	✓	208	52; 57
3.	Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1	✓	✓	✓	208-209	37; 53

AT6- Halderman

4.	Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid per manufacturer specifications; bleed air as required.	P-1	✓	✓	✓	209-211	47, 48
5.	Inspect, remove, and replace water pumps.	P-2		✓	✓	203-204	75
	<b>Task</b>	<b>Priority</b>	<b>MLR</b>	<b>AST</b>	<b>MAST</b>	<b>Text Page #</b>	<b>Task Page #</b>
6.	Remove and replace radiator.	P-2		✓	✓	206-210	55
7.	Remove, inspect, and replace thermostat and gasket/seal.	P-1	✓	✓	✓	196-199	54; 203
8.	Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action	P-1		✓	✓	205-206	56; 204
9.	Perform oil pressure tests; determine needed action.	P-1		✓	✓	260-261	74
10.	Perform engine oil and filter change; use proper fluid type per manufacturer specifications; reset maintenance reminder as required	P-1	✓	✓	✓	144-145; 220-224	35; 58
(6)	Identify components of the lubrication and cooling systems.	P-1	✓ (MLR only)			195-234	50
11.	Inspect auxiliary coolers; determine needed action.	P-3		✓	✓	1693-1694	61
12.	Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2		✓	✓	221	62
13.	Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action.	P-2			✓	227-232	60